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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,762	09/26/2003	Rajdeep S. Kalgutkar	58634US002	1048
32692	7590	04/19/2005	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			BERMAN, SUSAN W	
			ART UNIT	PAPER NUMBER
			1711	
DATE MAILED: 04/19/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/672,762	Applicant(s) KALGUTKAR ET AL.	
	Examiner Susan W. Berman	Art Unit 1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,7-10 and 24-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-6 and 11-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-39 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3,6,12/2004;3/05</u> | 6) <input type="checkbox"/> Other: ____  |

*u*

*Election/Restriction*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-23, drawn to a composition comprising ethylenically unsaturated monomers, an arylsulfinate and an electron acceptor, classified in class 526, subclass 332.
- II. Claims 24-32 and 39, drawn to a method of photopolymerization with actinic radiation, classified in class 522, subclass 25.
- III. Claims 33-38, drawn to a method of polymerization comprising reacting the polymerizable composition, classified in class 526, subclass 193.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II or III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process of polymerization such as a process of photopolymerization or a process of thermal polymerization or a process of imaging.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and a separate status in the art because of their recognized divergent subject matter, and because the search required for Group II is not required for Group I or Group III, restriction for examination purposes as indicated is proper.

*Election/Restrictions*

This application contains claims directed to the following patentably distinct species of the claimed invention: different compositions comprising different species of arylsulfinate electron donor, different species of electron acceptor (see claim 17).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species of arylsulfinate electron donor and a single disclosed species of electron acceptor for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1, 21, 24 and 33 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Jean A. Lown on April 18, 2005, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-23, and the arylsulfinate species 4-cyanophenylsulfinate tetraphenyl phosphonium salt with the electron donor species diphenyliodonium

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salt of hexafluorophosphate, claims 1, 4, 5, 6, 12 and 17-23. Affirmation of this election must be made by applicant in responding to this Office action. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Claims 24-39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 2, 3, 7-11 and 13-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected species of the elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

**The election of species with respect to electing the ammonium or phosphonium cation of the electron donor set forth in the instant claims is hereby withdrawn. No prior art teaching an arylsulfinate salt of a phosphonium cation in combination with an electron acceptor has been found. Therefore, claims 11 and 13-16 are rejoined with the elected claims.**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-6, 11, 13-15, 17, 18, 20 and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawashima et al (5,486,544). Kawashima et al disclose polymerizable compositions

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comprising ammonium aryl sulfinates. Kawashima et al teach adding an oxidizer such as an organic peroxide to accelerate the reaction (column 6, line 64, to column 7, line 13). Photosensitizers may also be employed in the initiator system (column 7, lines 36-46). Hydroxyl-functional methacrylates are disclosed among the monomers taught in column 6 and in the examples.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 11, 13-15 and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farid et al (4,859,572) in view of Kawashima et al. See the discussion of the disclosure of Kawashima et al set forth above. Farid et al disclose an initiator system for ethylenically unsaturated components comprising an electron acceptor activator, an electron donor activator and a dye photosensitizer. The electron donor can be an arylsulfinate (column 8, line 7). Electron acceptor compounds include sulfonium salts and iodonium salts (column 8, lines 51-68). Farid et al do not provide any motivation to select arylsulfates and onium activators from the electron donors and electron acceptors disclosed. Kawashima et al teach that polymerizable compositions comprising an aromatic sulfinate as polymerization initiator have excellent storage stability.

It would have been obvious to one skilled in the art at the time of the invention to select an initiator system from those disclosed by Farid et al wherein the electron donor is an ammonium arylsulfinate salt and an electron acceptor, as taught by Kawashima et al. Farid et al provide motivation by teaching that amines or arylsulfinate salts are useful electron donor compounds and that sulfonium salts and iodonium salts are useful electron acceptor compounds. Kawashima et al provide motivation to

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select an aromatic sulfinate, such as ammonium arylsulfinate, from the electron donors taught by Farid et al by teaching that compositions comprising an aromatic sulfinate have extended storage stability.

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4-6 and 11-23 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of copending Application No. 10/672,554. Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. The differences between the claims of Application No. 10/672,554 and the instant claims are (1) the oxidation potential of the electron donor is not set forth and (2) the electron acceptor is limited to a triarylsulfonium salt in the claims of '554. The arylsulfinate salts recited in both applications is the same and thus has the same oxidation potential. Farid et al (4,859,572) disclose an initiator system for ethylenically unsaturated components comprising an electron acceptor activator, an electron donor activator and a dye photosensitizer. The electron donor can be an arylsulfinate (column 8, line 7). Electron acceptor compounds include sulfonium salts and iodonium salts (column 8, lines 51-68). It would have been obvious to one skilled in the art at the time of the invention to substitute other known electron acceptors, such as an iodonium salt, for the sulfonium salt set forth in the claims of '554 in compositions comprising an electron donor such as the recited arylsulfinate salt set forth in the claims of

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'554 and in instant claims, as taught by Farid et al. Farid et al provide motivation by teaching that sulfonium salts and iodonium salts are useful electron acceptor compounds.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 4-6 and 11-23 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/672,814. Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. The difference between the claims of Application No. 10/672,814 and the instant claims is that the claims of '814 require a "dental additive". It would have been obvious to one skilled in the art at the time of the invention to omit the dental additive in the claims of '814 in order to provide a composition for coating or film-forming instead of for a dental application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 4-6 and 11-23 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 and 21-23 of copending Application No. 10/847,523. Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. The difference between the claims of Application No. 10/847,523 and the instant claims is that the claims of '523 recite an arylsulfinate salt and a sensitizing compound while the instant claims recite the same arylsulfinate salt and an electron acceptor. Farid et al (4,859,572) disclose an initiator system for ethylenically unsaturated components comprising an electron acceptor activator, an electron donor activator and a dye photosensitizer. The electron donor can be an arylsulfinate (column 8, line 7). The photosensitizers disclosed are dyes, corresponding to the



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photosensitizing dyes set forth in claims 21-22 of '523 (column 10. Electron acceptor compounds, include sulfonium salts and iodonium salts, are also disclosed (column 8, lines 51-68). It would have been obvious to one skilled in the art at the time of the invention to include an electron acceptor, such as an iodonium salt or sulfonium salt taught by Farid et al, in the compositions set forth in the claims of '523. Farid et al provide motivation by teaching compositions comprising an electron donor such as an arylsulfinate salt and a photosensitizer, as set forth in the claims of '523, and an electron acceptor, as set forth in the instant claims. Farid et al provide motivation by teaching that sulfonium salts and iodonium salts are useful electron acceptor compounds in compositions comprising an arylsulfinate salt and a photosensitizer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 2002-341519, cited by applicant, discloses thermosensitive compositions comprising ethylenically unsaturated monomers, an ammonium arylsulfinate and dye sensitizers. The arylsulfinate salts can also be iodonium or sulfonium salts, however, J '519 does not teach the instantly claimed requirement for an electron donor having the recited oxidation potential in combination with an electron acceptor having the recited reduction potential.

Parker (5,105,006) discloses phosphonium salts, including phosphonium salts wherein the anion is an arylsulfinate, as initiator for epoxy resins reacting with carbonate or ester linkages (column 1, line 60 to column 2, lines 68). Preparation of tetrabutylphosphonium benzene sulfinate is taught in Example 6. No electron acceptors are mentioned.

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Ali et al (4,971,892) disclose compositions comprising ethylenically unsaturated compounds, a visible light sensitizing initiator system comprising a photoinitiating iodonium salt or halogenated triazine electron acceptor and a merocyanine sensitizing dye. Electron donors or arylsulfinate salts are not mentioned.

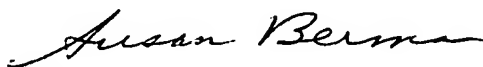
Each of the following references discloses compositions comprising an ammonium benzenesulfinate and an organic peroxide: Mukai et al (4,983,644), Iwamoto et al (4,755,620), Huang et al (4,966,934) and Bunker (5,304,585). However, there is no disclosure of a benzenesulfinate having a substituent that is an electron withdrawing group or an electron withdrawing group in combination with an electron donating group.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W. Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SB  
4/18/05

  
Susan W Berman  
Primary Examiner  
Art Unit 1711